

**NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD**

IRRIGATION WATER MANAGEMENT

(Acre)

CODE 449

DEFINITION

Irrigation water management is the process of determining and controlling the volume, frequency, and application rate of irrigation water in a planned, efficient manner.

PURPOSE

Irrigation water management is applied as part of a conservation management system to support one or more of the following:

- Manage soil moisture to promote desired crop response
- Optimize use of available water supplies
- Minimize irrigation induced soil erosion
- Decrease non-point source pollution of surface and groundwater resources
- Manage salts in the crop root zone
- Manage air, soil, or plant micro-climate.

CONDITIONS WHERE PRACTICE APPLIES

This practice is applicable to all irrigated lands.

An irrigation system adapted for site conditions (soil, slope, crop(s) grown, climate, water quantity and quality, etc.) must be available and capable of applying water to meet the intended purpose(s).

This practice does not apply to "wild flood" situations. Refer to code 640 Waterspreading.

CRITERIA

General Criteria Applicable to All Purposes

All work shall comply with Federal, State, and local laws and regulations. Water shall not be applied in excess of the amounts needed to meet the intended purpose(s).

The Utah Irrigation Guide will be used as a reference for developing Irrigation Water Management specifications.

Additional Criteria to Manage Soil Moisture to Promote desired Crop Response

The following principles shall be applied for various crop growth stages:

- The volume of water needed for each irrigation shall be based on plant requirements, available water holding capacity of the soil for the crop rooting depth, management allowed soil water depletion, irrigation efficiency, and water table contributions.
- The irrigation frequency shall be based on the volume of irrigation water to be applied and/or available, crop evapotranspiration, and effective precipitation.
- The application rate shall be based on the volume of water to be applied, the frequency of irrigation applications, soil infiltration and permeability characteristics, and the capacity of the irrigation system.

Irrigation systems will be managed to achieve the following minimum seasonal irrigation efficiencies: trickle - 70 percent, sprinkler - 60 percent, surface - 50 percent, and contour ditch - 25 percent.

Additional Criteria to Optimize Use of Water Supplies

Evaluate the amount of available water relative to the irrigated acreage and manage to optimize crop production.

Additional Criteria to Minimize Irrigation Induced Soil Erosion

Irrigation application rates and length of runs shall be consistent with field slopes, soil textures, and residue management, to minimize irrigation induced soil erosion.

Additional Criteria to Decrease Non-Point Source Pollution of Surface and Groundwater Resources

Irrigation water shall be applied at rates that minimize runoff and/or leaching of sediments, nutrients, pesticides, or other pollutants to surface and groundwater.

Additional Criteria to Manage Salts in the Crop Root Zone

The irrigation application volume shall be increased by the amount required to maintain an appropriate salt balance in the soil profile.

The requirement shall be based on the leaching procedure contained in the National Engineering Handbook (NEH) Part 623, Chapter 2.

Additional Criteria to Manage Air, Soil, or Plant Micro-Climate

The irrigation system shall have the capacity to apply the required rate for frost protection or crop and soil cooling as outlined in NEH Part 623, Chapter 2.

CONSIDERATIONS

The following items should be considered when planning irrigation water management:

- Consider operator objectives and management abilities, water delivery schedule, economics, and operation and maintenance requirements.
- Consideration should be given to managing precipitation effectiveness, crop residues, and reducing system losses.

- Modify plant populations, crop and variety selection, and irrigated acres to match available or anticipated water supplies.
- Consider potential for spray drift and odors when applying agricultural and municipal wastewater.
- Equipment modifications and/or soil amendments such as polyacrylamides and mulches should be considered to decrease irrigation induced erosion.
- Consider the quality of water and the potential impact to crop quality and plant development.
- Quality of irrigation water should be considered relative to its potential effect on the soil's physical and chemical properties, such as soil crusting, pH, permeability, salinity, and structure.
- Avoid traffic on wet or moist soils to minimize soil compaction.
- Consider the effects that irrigation water has on wetlands, water related wildlife habitats, riparian areas, cultural resources, and recreation opportunities.
- Consider implementing additional practices such as nutrient and pest management and waste utilization.
- Consider the timing of nutrient and pesticide applications when scheduling leaching events to avoid groundwater pollution.
- Consideration should be given to electrical load control/interruptible power schedules, repair and maintenance downtime, and harvest downtime.
- Consider improving the irrigation system to increase distribution uniformity of irrigation water application.
- Consider the effects of tailwater runoff and other potential off site impacts.

PLANS AND SPECIFICATIONS

Application of this standard will include, as a minimum, specification sheets or similar documents that specify the water supply, method of irrigation, crops grown, soils, variations in soil and water supply, crop needs, irrigation scheduling, and monitoring necessary for applying and maintaining the practice to achieve its intended purpose(s).

OPERATION AND MAINTENANCE

There are no operation and maintenance (O&M) aspects applicable to this standard. Necessary O&M items are addressed in the physical component standards considered companions to this standard.